What is claimed is:

1. A method of characterizing surface structures which comprises

(I) using a chemically curable impression material to take an impression of at least one site

(I.1) of the undamaged surface of an article,

(I.2) of a surface of an article damaged by mechanical and/or chemical exposure and/or by exposure to radiation and/or heat, and/or

(I.3) of a surface of a test specimen mounted on the surface of an article, said test specimen surface being damaged by mechanical and/or chemical exposure and/or by exposure to radiation and/or heat,

(II) curing the impression material to produce a negative of the damage pattern, and

(III) using image analysis to determine the extent (%) of the surface structures and/or the extent (%) of the surface damage within the damage pattern on the basis of light-microscope pictures of the negative.

2. The method as claimed in claim 1, wherein a positive is produced from the negative.

3. The method as claimed in claim 2, wherein the extent (%) of the

surface structures and/or the extent (%) of the surface damage in the damage pattern is determined by image analysis on the basis of light-microscope pictures of the positive.

4. The method as claimed in claim 2, wherein the surface structures or the damage pattern are or is characterized additionally on the basis of the positive by means of AFM (atomic force microscopy) and SEM (scanning electron microscopy).

5. The method as claimed in any of claims 1 to 4, wherein a composition containing olefinically unsaturated double bonds is used as chemically curable impression material.

6. The method as claimed in claim 5, wherein a composition based on silicone is used.

7. The method as claimed in any of claims 1 to 6, wherein the chemically curable impression material is pressed onto the surface of the article or test specimen in the form of a disk, using a metal die, is cured beneath the metal die, the metal die is removed from the cured disk of impression material, and the cured disk of impression material (negative) is removed from the automobile body or the test panel.

8. The method as claimed in any of claims 2 to 7, wherein a positive is produced from the negative by contacting the negative with a liquid polymer material and then solidifying the liquid polymer material in contact with the negative and removing the resultant positive from the negative.

9. The method as claimed in any of claims 1 to 3 and 5 to 8, wherein the negative and the positive are sputter-coated with a precious metal for the light-microscope pictures.

10. The method as claimed in any of claims 1 to 3 and 5 to 9, wherein a high-resolution digital camera is fitted to a light microscope for the light-microscope pictures.

11. The method as claimed in claim 10, wherein an objective magnification of from 5:1 to 100:1 is used.

12. The method as claimed in any of claims 1 to 3 and 5 to 11, wherein microscope pictures of at least two measurement fields are taken.

13. The method as claimed in any of claims 1 to 3 and 5 to 12, wherein the measurement field is from 200 x 100 μm^2 to 1 500 x 1 000 μm^2.

14. The method as claimed in any of claims 1 to 3 and 5 to 13, wherein imaging, image analysis, and image archiving are carried out using an image processing program.

15. The method as claimed in any of claims 1 to 3 and 5 to 14, wherein for imaging color microscope pictures are taken.

16. The method as claimed in any of claims 1 to 3 and 5 to 15, wherein the image analysis embraces the following steps:

(1) production of the original image and shading correction,

(2) production of a green separation,

(3) setting of threshold values, production of a binary image, and image filtering,

(4) particle separation and, if desired, erosion and dilation,

(5) detection and classification,

(6) transfer to an Excel table,

(8) production of statistics from 5 to 20 measurement fields, and

(9) evaluation.

17. The method as claimed in claim 16, wherein for detection (5) of the surface structures or surface damage in the binary image (3) the following shape parameter are defined:

(a) area of a particle (surface structure or surface damage) = (number of pixels) x (calibration factors in X und Y direction),

(b) aspect ratio = maximum height/width ratio of an enclosing rectangle of the particle, and

(c) shape factor = $4\pi\ a/U^2$, where a = area and U = periphery.

18. The method as claimed in claim 16 or 17, wherein the surface structures or surface damage are or is classified according to area or according to width.

19. The method as claimed in claim 18, wherein classification according to area takes place into at least 10 area classes and classification according to width takes place into at least 5 Feret-min width classes, Feret-min being defined as the minimum distance between parallel tangents to opposite particle edges, or into at least 5 classes of mean width, the mean width being defined as the ratio of area to Feret-max (length of the particle).

20. The method as claimed in claim 18 or 19, wherein in the case of classification according to area the surface structure extent or surface damage extent (%) of each area class is determined and also the total surface structure extent or total surface damage extent (%) of all area classes, and in the case of classification according to width, the surface structure extent or surface damage extent (%) of each width class and also the total surface structure extent or surface damage extent (%) of all width classes is determined.

21. The method as claimed in any of claims 1 to 20, which is used in the preparation, modification and/or development of new and/or existing materials.